LANDS AND FORESTS
TECHNICAL NOTE

NOVA SCOTIA UPLAND GAME SURVEY—1990

by Barry Sabean

Introduction

In 1989 the small game mail survey was replaced by the upland game report card attached to the small game license. This technical note outlines the second year's results for this system and compares it to the first year.

Results

A total of 25,894 residents and 192 non-residents purchased small game licenses, down 8.2 per cent from the previous year. In addition, 5,618 senior citizens* obtained free small game licenses for a total of 31,704 potential hunters. There were 2,967 report cards returned; a response rate of 9.4 per cent up from 8.5 per cent in 1989.

Thirty-five per cent of license holders reported no hunting of upland game in 1990 compared to 16 per cent in 1989. The active hunters reported hunting one or more counties as follows:

	1989	1990
One county	83.7%	86.1%
Two counties	13.0%	10.9%
Three counties	2.5%	2.2%
Four or more counties	0.8%	0.8%

The percentage of hunters who reported hunting for various combinations of species is reported below:

	1989	1990
Ruffed grouse only	36.8%	34.1%
Pheasant only	4.5%	4.9%
Snowshoe hare only	7.7%	10.5%
Hare and grouse	32.8%	32.5%
Hare and pheasant	1.7%	2.5%
Pheasant and grouse	7.1%	5.9%
Pheasant, grouse and hare	9.4%	9.8%

*Prior to 1990 senior citizens could obtain a free hunting license entitling them to hunt either big or small game. No report card was attached so it was not possible to determine how many hunted small game. All were considered potential hunters when total kill calculations were made. This appears to have resulted in an overestimate of approximately 13 per cent between 1984 and 1989. For the purpose of this report, calculated total harvests for those years have been adjusted appropriately.

The calculated hunting effort for the province by species and year for license holders is as follows:

	1989	1990
Days hunting snowshoe hare	69,618	57,084
Days snaring snowshoe hare	69,518	44,589
Days hunting ruffed grouse	163,786	106,084
Days hunting pheasant	28,682	22,129

Tables 1–7 summarize effort, success, and kill for all species. In Table 2, the decrease in kill per day in 1990 was highly significant for hare hunting, hare snaring, and grouse hunting. No significant change was noted for pheasants.

Conclusion

Hunting Effort

Hunting effort was down considerably in 1990 as a result of reduced license sales and a higher proportion of license holders who did not hunt. In contrast, those who did hunt reported little difference in their effort as compared to 1989 (see Table 1).

Snowshoe Hare

The provincial harvest of snowshoe hare was the lowest since records were begun in 1968. Although this is partially a result of reduced hunter effort, it is also evident from Tables 2 and 3 that success rates for hunters were down considerably, indicating a population drop in hares. The 1990 hare pellet surveys also showed a population decline.

A cold wet May in 1990 is thought to have contributed to poor reproductive success in snowshoe hare and is a least partially responsible for the drop in this species.

Ruffed Grouse

Ruffed grouse harvests fell from the highest level in 12 years in 1989 to the lowest on record in 1990. Once again reduced hunter effort was partly to blame but Tables 2 and 3 clearly indicate a steep population decline between the two years.

As in snowshoe hare, poor reproductive success due to the cold wet May appears to have been the major factor.

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Table 1. *Days hunting upland game by county of residence*

County of Residence	Rabbit Hunters 1989 Days/ Hunter	N*	Rabbit Hunters 1990 Days/ Hunter	N	Rabbit Snarers 1989 Days/ Snarer	N	Rabbit Snarers 1990 Days/ Snarer	N	Grouse Hunters 1989 Days/ Hunter	N	Grouse Hunters 1990 Days/ Hunter	N	Pheasant Hunters 1989 Days/ Hunter	N	Pheasant Hunters 1990 Days/ Hunter	N
Annapolis	8.0	42	11.1	49	9.0	10	9.0	9	10.2	70	7.8	77	3.7	26	6.4	39
Digby	7.0	34	6.2	34	10.8	12	19.1	15	7.8	51	9.2	42	7.4	32	5.2	28
Kings	6.5	59	4.8	63	17.1	9	11.5	10	5.7	101	4.2	84	4.0	69	4.5	75
Lunenburg	4.8	95	5.4	76	11.9	29	12.1	27	6.7	142	6.1	129	4.4	34	4.9	39
Queens	7.2	26	4.2	17	12.4	17	11.3	15	9.8	58	8.8	48	6.8	5	5.0	4
Shelburne	4.2	19	3.8	12	14.6	17	17.8	11	7.9	30	8.4	24	1.7	6	1.0	2
Yarmouth	5.1	40	5.3	40	15.1	18	16.9	22	7.9	53	7.3	63	6.2	30	6.5	25
West	6.0	315	6.2	291	12.9	112	14.2	109	7.6	505	6.9	467	4.9	202	5.3	212
Antigonish	3.2	11	5.9	18	12.3	9	15.3	9	5.8	24	7.5	24	1.0	1	1.0	1
Colchester	5.5	29	6.3	48	15.0	11	10.2	12	6.6	98	6.6	119	4.0	18	5.6	28
Cumberland	7.1	36	5.8	52	13.9	20	10.1	11	7.9	111	7.5	100	5.3	23	4.5	23
Guysborough	5.7	20	8.2	25	18.2	17	19.3	18	6.4	38	4.7	39	0.0	0	7.0	2
Halifax	5.1	176	5.1	223	11.7	68	12.1	67	4.6	321	5.0	332	4.4	109	3.9	110
Hants	6.0	49	6.3	42	12.9	28	10.0	7	9.4	69	5.4	69	6.0	29	4.6	22
Pictou	6.6	40	5.6	50	12.2	11	10.2	6	7.4	73	6.9	95	5.3	10	8.7	9
East	5.6	361	5.7	458	13.1	164	12.8	130	6.2	734	5.9	778	4.7	190	4.5	195
Cape Breton	6.4	65	6.0	69	11.8	31	11.9	18	7.3	145	7.1	128	4.2	6	4.1	9
Inverness	4.4	29	5.5	33	10.0	24	14.6	25	10.2	86	8.0	77	7.3	4	3.2	6
Richmond	5.6	26	9.7	27	14.7	23	14.1	23	8.5	42	10.7	35	1.0	1	0.0	0
Victoria	3.8	8	3.7	10	5.6	5	0.0	0	9.0	29	6.9	26	0.0	0	0.0	0
Cape Breton	5.6	128	6.4	139	11.7	83	13.7	66	8.5	302	7.8	266	5.0	11	3.7	15
Unknown	6.7	39	9.9	7	15.3	20	14.8	4	7.2	71	7.8	10	4.8	15	5.0	4
Total	5.8	843	6.0	895	12.9	379	13.5	309	7.1	1612	6.5	1521	4.8	418	4.9	426

* "N" IS ANYONE WHO RETURNED A REPORT CARD AND WHO REPORTED AT LEAST ONE DAY OF EFFORT FOR THE INDICATED SPECIES

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This weather occurred at a time when grouse were incubating and the excessive moisture combined with cold temperatures resulted in low hatching success. Many hens could not re-nest because they were in poor physical condition after spending an excessive length of time trying to hatch dead eggs.

Ring-necked Pheasant

Although harvest was down somewhat in 1990, this appears to be largely a result of fewer hunter days. Tables 2 and 3 show evidence of only slight declines in hunter success at the provincial level. Based on our cock crowing census, hunter success, and hunter comments, the population was down only marginally from the 1989 level.

The cold wet May weather probably affected pheasant reproduction, although it appears that re-nesting at least partly compensated. This was evidenced by the high number of young, poorly coloured cocks reported in the harvest. Pheasants likely had more of their nests destroyed by predators and human intervention (mowing, etc.) than grouse and therefore would have been in a better physiological condition to re-nest.

Report Card Returns

Although the per cent return of report cards was up slightly in 1990, it still remains below 10 per cent and this makes it difficult to detect trends at the county level. If more hunters can be encouraged to return their cards, this problem would be overcome.

Barry Sabean
May 15, 1991

Table 2. *Kill per hunter day by year for Hare, Grouse and Pheasants*

	Hares Killed/ Day Hunting		Hares Killed/ Day Snaring		Grouse Killed/ Day Hunted		Pheasants Killed/ Day Hunted	
County	'89	'90	'89	'90	'89	'90	'89	'90
Annapolis	0.75	0.47	0.43	0.87	0.70	0.24	0.34	0.33
Digby	1.52	0.76	0.94	0.51	0.76	0.26	0.37	0.30
Kings	1.54	0.93	0.58	0.68	0.64	0.37	0.72	0.69
Lunenburg	0.67	0.23	0.66	0.38	0.41	0.19	0.09	0.18
Queens	0.39	0.20	0.75	0.51	0.50	0.24	0.17	0.06
Shelburne	1.18	1.20	1.22	0.72	0.54	0.46	0.00	0.00
Yarmouth	1.09	0.94	0.56	1.04	0.50	0.31	0.22	0.12
West	0.96	0.59	0.77	0.67	0.57	0.27	0.42	0.41
Antigonish	1.17	0.51	0.74	0.33	1.22	0.55	0.00	0.00
Colchester	0.44	0.29	0.78	0.24	0.76	0.31	0.23	0.25
Cumberland	1.06	0.64	1.40	1.31	0.84	0.37	0.22	0.27
Guysborough	0.57	0.22	0.80	0.44	0.95	0.38	0.00	0.00
Halifax	0.74	0.44	0.84	0.57	0.52	0.27	0.56	0.20
Hants	0.53	0.35	0.38	0.25	0.35	0.38	0.28	0.23
Pictou	0.97	0.57	0.92	2.63	1.00	0.38	0.00	0.06
East	0.74	0.43	0.83	0.60	0.73	0.35	0.26	0.21
Cape Breton	0.29	0.23	0.70	0.36	0.89	0.39	1.00	0.44
Inverness	0.59	0.28	0.93	0.47	1.27	0.47	0.07	0.00
Richmond	0.24	0.28	1.16	0.86	0.88	0.39	0.00	0.00
Victoria	0.55	0.22	2.76	0.00	1.16	0.43	0.00	0.00
Cape Breton	0.37	0.26	1.10	0.59	1.09	0.42	0.12	0.15
Province	0.79	0.46	0.86	0.63	0.75	0.33	0.37	0.34

Note: Because of report card design, only hunters who hunted one county could be used in these calculations. They do not necessarily portray total kill/hunter but are useful for year to year comparisons.

Table 3. *Kill per hunter by successful* hunters*

County	Snowshoe Hare/89 N	Kill/ Hunter	Stdev	Ruffed Grouse/89 N	Kill/ Hunter	Stdev	Pheasant/89 N	Kill/ Hunter	Stdev	Snowshoe Hare/90 N	Kill/ Hunter	Stdev	Ruffed Grouse/90 N	Kill/ Hunter	Stdev	Pheasant/90 N	Kill/ Hunter	Stdev	Change from 1989 Hare	Grouse	Phes.
Annapolis	54	8.43	10.83	95	5.92	6.88	31	2.81	2.01	42	10.45	12.08	67	2.61	2.13	38	2.95	2.85	**	—	**
Digby	38	14.49	16.24	69	6.93	6.80	33	3.27	3.87	41	8.20	9.67	28	3.68	3.02	23	2.35	1.50	—	—	**
Kings	63	9.87	10.93	102	4.28	4.87	91	4.89	5.45	67	7.85	10.28	65	2.86	2.87	95	4.68	6.40	**	—	**
Lunenburg	79	7.25	8.63	123	3.72	4.34	9	1.22	0.44	61	4.56	6.51	85	2.21	1.85	12	2.42	1.44	—	—	xxxx
Queens	34	8.26	11.33	87	5.34	4.52	2	3.50	0.71	19	6.37	6.36	52	3.08	2.45	2	1.00	0.00	**	—	xxxx
Shelburne	31	15.52	26.09	31	5.19	5.86	1	1.00	0.00	20	11.50	19.85	22	5.50	7.42	0	0.00	0.00	**	**	xxxx
Yarmouth	45	10.51	12.06	54	4.17	3.56	21	2.24	1.87	44	14.89	31.83	53	2.94	2.83	12	2.67	2.23	-	—	xxxx
West	344	9.99	13.58	561	4.96	5.19	188	3.76	3.89	294	8.79	15.29	370	2.93	2.72	182	3.70	4.37	**	—	**
Antigonish	24	11.33	13.60	45	5.56	9.73	1	2.00	0.00	25	9.04	18.17	36	3.47	2.70	0	0.00	0.00	**	-	xxxx
Colchester	62	5.85	7.10	159	4.92	6.93	18	1.89	1.68	51	4.35	4.23	113	3.28	3.82	19	2.89	4.50	-	—	xxxx
Cumberland	60	13.88	22.49	138	6.16	6.35	20	1.80	0.95	43	9.98	20.58	79	3.82	3.43	17	2.65	2.26	**	—	xxxx
Guysborough	24	12.46	24.65	60	4.58	4.62	0	0.00	0.00	36	7.61	8.52	48	2.96	2.50	1	1.00	0.00	**	—	xxxx
Halifax	107	10.49	16.89	116	5.47	2.88	17	2.35	3.62	108	6.91	10.20	110	2.55	2.27	10	2.90	1.97	—	—	xxxx
Hants	65	6.34	7.25	93	3.70	3.33	35	3.49	3.04	43	4.93	5.26	64	2.48	1.89	20	3.40	3.84	**	—	**
Pictou	38	10.58	14.15	84	6.79	10.50	0	0.00	0.00	38	9.29	19.62	81	3.64	3.67	3	2.33	0.58	**	—	xxxx
East	380	9.74	16.71	695	5.00	6.05	91	2.57	2.39	344	7.16	11.44	531	3.15	2.99	70	2.93	3.17	—	—	**
Cape Breton	37	9.05	12.06	99	6.76	7.13	3	2.33	2.31	41	5.88	11.13	71	3.70	4.18	3	1.67	1.15	**	—	xxxx
Inverness	46	8.61	8.41	132	10.39	14.99	3	1.67	1.15	34	7.68	7.40	79	4.53	4.14	0	0.00	0.00	**	—	xxxx
Richmond	36	12.28	18.70	64	6.23	10.32	0	0.00	0.00	32	8.71	13.67	60	4.23	3.99	0	0.00	0.00	**	-	xxxx
Victoria	18	11.33	23.06	61	8.13	8.24	0	0.00	0.00	9	3.00	2.78	35	3.37	2.78	0	0.00	0.00	xxxx	—	xxxx
Cape Breton	137	10.05	15.63	356	8.25	10.81	6	2.00	1.73	136	7.22	10.62	245	4.08	3.92	3	1.67	1.15	—	—	xxxx
NS Unknown	9	7.67	7.55	22	4.14	4.11	3	1.33	0.58	5	13.40	15.63	2	4.00	2.83	1	4.00	0.00	xxxx	xxxx	xxxx
Province	870	9.87	14.73	1,634	5.68	7.68	288	3.32	3.90	779	7.83	13.86	1,148	3.28	3.10	256	3.47	3.95	—	—	**
Valley Annn, Kings, Hants							157	4.17	4.55							153	4.08	5.14			**

* successful is a hunter who killed at least one animal in the county

Change from previous year:
xxxx insufficient data
** no significant change
+ significant increase at P<.10
++ significant increase at P<.05
+++ significant increase at P<.01
- significant decrease at P<.10
-- significant decrease at P<.05
--- significant decrease at P<.01

Table 4. *Total kill by all report card returnees by county hunted in 1990*

County	# Replies	# Hares With Dog	# Hares No Dog	# Hares Snared	Total Hares	# Grouse	# Pheasants	Calculated Kill Total # Hares	# Grouse	# Pheasants
Annapolis	133	208	161	70	439	175	112	4,691	1,870	1,197
Digby	74	161	11	164	336	103	54	3,590	1,101	577
Kings	204	222	229	75	526	180	445	5,621	1,923	4,755
Lunenburg	180	83	67	128	278	188	29	2,971	2,009	310
Queens	95	1	23	97	121	160	2	1,293	1,710	21
Shelburne	42	39	20	171	230	121	0	2,458	1,293	0
Yarmouth	87	205	37	413	655	156	32	6,999	1,667	342
West	815	919	548	1,118	2,585	1,083	674	27,622	11,572	7,202
Antigonish	53	2	82	142	226	125	0	2,415	1,336	0
Colchester	207	97	91	34	222	371	55	2,372	3,964	588
Cumberland	161	57	228	144	429	302	45	4,584	3,227	481
Guysborough	90	16	51	207	274	142	1	2,928	1,517	11
Halifax	290	192	153	401	746	281	29	7,971	3,003	310
Hants	150	126	32	54	212	159	68	2,265	1,699	727
Pictou	118	21	181	151	353	295	7	3,772	3,152	75
East	1,069	511	818	1,133	2,462	1,675	205	26,308	17,898	2,191
Cape Breton	119	21	91	129	241	263	5	2,575	2,810	53
Inverness	122	1	68	192	261	366	0	2,789	3,911	0
Richmond	92	13	117	323	453	254	0	4,841	2,714	0
Victoria	51	2	25	0	27	118	0	289	1,261	0
Cape Breton	384	37	301	644	982	1,001	5	10,493	10,696	53
Unknown	17	15	1	51	67	8	4	716	85	43
Province	2,285	1,482	1,668	2,946	6,096	3,767	888	65,139	40,252	9,489

Table 5. *Calculated kill of snowshoe hare harvested before December 16, 1984-90*

County	1984	1985	1986	1987	1988	1989	1990
Annapolis	9,702	8,114	8,351	2,095	3,544	6,476	4,691
Digby	9,493	10,456	18,531	12,911	5,671	7,728	3,590
Kings	6,687	4,888	2,967	4,428	6,100	8,852	5,621
Lunenburg	7,553	6,213	7,384	5,002	4,618	8,155	2,971
Queens	3,500	5,636	3,279	1,318	3,029	4,000	1,293
Shelburne	8,039	11,270	8,696	3,921	5,800	6,846	2,458
Yarmouth	9,355	7,027	6,073	13,520	8,871	6,732	6,999
West	54,329	53,605	55,281	43,196	37,635	48,790	27,622
Antigonish	7,276	10,185	4,900	7,604	5,328	3,871	2,415
Colchester	11,053	19,180	5,176	3,211	4,511	5,166	2,372
Cumberland	14,275	19,588	11,733	9,430	21,954	11,856	4,584
Guysborough	12,681	11,033	4,866	6,625	9,946	4,255	2,928
Halifax	33,782	14,428	6,039	11,255	11,793	15,969	7,971
Hants	11,538	5,975	7,764	4,901	9,194	5,864	2,265
Pictou	10,152	7,028	4,555	3,109	6,488	5,721	3,772
East	100,757	87,316	45,033	46,135	69,213	52,702	26,308
Cape Breton	11,018	10,456	15,425	6,692	7,518	4,768	2,575
Inverness	11,954	16,905	24,466	14,939	5,285	5,636	2,789
Richmond	10,845	7,877	5,210	2,400	9,000	6,291	4,841
Victoria	8,039	7,028	9,317	4,192	2,191	2,904	289
Cape Breton	41,855	42,266	54,418	28,224	23,995	19,599	10,493
Unknown						840	716
Province	196,941	183,286	154,733	117,555	130,842	121,930	65,139

Table 6. *Calculated kill of ruffed grouse 1984-90*

County	1984	1985	1986	1987	1988	1989	1990
Annapolis	5,267	5,330	5,004	5,340	2,213	7,999	1,870
Digby	2,599	3,123	3,726	1,622	2,836	6,803	1,101
Kings	3,985	2,241	4,279	3,684	4,060	6,220	1,923
Lunenburg	2,677	3,938	4,796	4,428	3,329	6,519	2,009
Queens	1,316	4,888	4,452	4,800	3,996	6,618	1,710
Shelburne	3,118	1,935	3,416	2,028	2,234	2,291	1,293
Yarmouth	2,495	3,565	3,037	2,129	1,353	3,202	1,667
West	21,457	25,020	28,710	24,032	20,020	39,652	11,572
Antigonish	2,391	3,734	3,278	3,819	2,771	3,558	1,336
Colchester	5,440	11,237	7,074	5,273	5,371	11,144	3,964
Cumberland	5,544	12,119	5,763	5,577	6,488	12,098	3,227
Guysborough	3,049	5,194	2,347	2,028	1,890	3,914	1,517
Halifax	7,346	4,379	3,726	3,854	4,640	5,735	3,003
Hants	4,678	4,786	3,934	4,360	5,478	4,896	1,699
Pictou	6,999	10 354	5,763	5,408	7,218	8,112	3,152
East	35,446	51,803	31,884	30,318	33,856	49,458	17,898
Cape Breton	4,851	11,508	4,279	3,278	6,702	9,522	2,810
Inverness	9,736	14,428	7,212	6,456	7,776	19,513	3,911
Richmond	2,564	4,753	2,347	1,690	4,210	5,679	2,714
Victoria	12,958	9,947	6,349	3,278	3,480	7,059	1,261
Cape Breton	30,109	40,635	20,187	14,702	22,168	41,773	10,696
Unknown						783	85
Province	87,012	117,459	80,781	69,051	76,044	131,666	40,252

Table 7. *Calculated kill of ring-necked pheasants 1984-90*

County	1984	1985	1986	1987	1988	1989	1990
Annapolis	1,248	1,698	1,035	811	903	1,238	1,197
Digby	728	1,629	3,831	1,048	1,203	1,537	577
Kings	5,336	3,904	4,520	2,366	3,588	6,334	4,755
Lunenburg	970	169	414	135	258	157	310
Queens	35	238	207	0	172	100	21
Shelburne	35	34	0	0	21	14	0
Yarmouth	797	340	587	777	429	669	342
West	9,147	8,011	10,594	5,137	6,574	10,048	7,202
Antigonish	70	204	0	0	0	28	0
Colchester	1,109	305	967	405	408	484	588
Cumberland	1,039	815	414	474	258	513	481
Guysborough	173	0	0	0	21	0	11
Halifax	1,143	169	518	270	1,203	569	310
Hants	1,594	1,324	1,415	1,724	1,117	1,736	727
Pictou	104	136	241	169	172	0	75
East	5,232	2,954	3,555	3,042	3,179	3,330	2,191
Cape Breton	104	0	0	68	408	100	53
Inverness	35	204	35	270	86	71	0
Richmond	35	0	0	0	0	0	0
Victoria	35	68	345	0	43	0	0
Cape Breton	208	272	380	338	537	171	53
Unknown						28	43
Province	14,587	11,237	14,528	8,517	10,290	13,577	9,489